

In the Claims

Please amend claims 1 and 7 as follows.

Listing of Claims

1. (currently amended) An image processing apparatus comprising:

a main processing unit that captures first image data by scanning all areas of a negotiable instrument for converting the first image data to binary image data upon the selection of one of at least a first and second binarization method with each being independent of one another and involving a separate analysis of selected gray scale data; and

a pre-processing unit that captures second image data acquired from a scanning of only a partial area of the negotiable instrument, with said pre-processing unit having an evaluation section for evaluating and selecting the first or second binarization method to be used in said main processing unit for converting the first image data to binary image data based on the evaluation of the second image data.

2. (original) An image processing apparatus as described in claim 1, wherein the partial area includes a text area containing magnetic ink characters preprinted to the negotiable instrument, and one or more background areas containing a background pattern in at least part thereof.

3. (original) An image processing apparatus as described in claim 2, wherein said evaluation section further comprises an edge pixel detection unit that detects edge pixels from the background area; and

first selection means for selecting the binarization method based on a relative comparison of the number of detected edge pixels to a predetermined value.

4. (original) An image processing apparatus as described in claim 2, wherein said evaluation section of said pre-processing unit selects the binarization method based on a threshold value calculation using a density distribution of pixels in the background of characters in the text area, and a density distribution of pixels forming the background area.

5. (original) An image processing apparatus as described in claim 1, wherein said pre-processing unit further comprises;

a threshold value calculator for setting a threshold value for use in executing the selected one of said binarization methods with the threshold value for said first binarization method being derived from a density distribution calculation of the second image data and with the threshold value for the second binarization method being set at a predefined constant value;

wherein said evaluation section will select the second binarization method when the threshold value calculated from said density distribution of the second image data exceeds a predetermined number or does not compute within a given range; and

secondary binarization means that sharpens the first image data by enhancing edge pixels of the first image data, when said threshold value is set at said predefined constant value during execution of said second binarization method.

6. (original) An image processing apparatus as described in claim 3, wherein said pre-processing unit further comprises;

a threshold value calculator for setting a threshold value for use in executing the selected one of said binarization methods with the threshold value for

said first binarization method being derived from a density distribution calculation of the second image data and with the threshold value for the second binarization method set at a predefined constant value;

histographic generation means for counting the number of pixels for each density value and means for computing density distribution from said pixel count;

wherein said evaluation section will select the second binarization method when the threshold value calculated from said density distribution from said histographic generation means exceeds a predetermined number or does not compute within a given range; and

secondary binarization means that sharpens the first image data by enhancing edge pixels of the first image data ;when said threshold value is set at said predefined constant value during execution of said second binarization method.

7. (currently amended) An image processing method for a negotiable instrument comprising the steps of:

(a) scanning an image of a partial area of the negotiable instrument;

(b) evaluating the scanned image of the partial area in step (a);

(c) selecting a binarization method from one of at least a first and second independent binarization method based upon the evaluation of the scanned image in step (b) with each such binarization method involving a separate analysis of selected gray scale data; and

(d) converting an image of the entire negotiable instrument to binary image data by applying the binarization method selected in step (c).

8. (original) An image processing method as described in claim 7, wherein the partial area includes a text area containing magnetic ink characters preprinted to the negotiable instrument, and one or more background areas containing a background pattern in at least part thereof.

9. (original) An image processing method as described in claim 8, further comprising the steps of:

(e) detecting edge pixels from the background area; and

(f) selecting the binarization method based on the number of edge pixels detected in step (e).

10. (original) An image processing method as described in claim 8, further comprising the steps of:

(g) selecting the binarization method based on a density distribution of pixels in the background of characters in the text area, and a density distribution of pixels forming the background area.

11. (original) An image processing method as described in claim 7, further comprising the steps of:

(h) setting a threshold value for use in executing the selected one of said binarization methods with the threshold value for said first binarization method being derived from a density distribution calculation in step (a) of the second image data and with the threshold value for said second binarization method set being at a predefined constant value;

(i) selecting said second binarization method when the threshold value calculated from said density distribution of the second image data in step (a) exceeds a predetermined number or does not compute within a given range; and

(j) sharpening the image of the entire negotiable instrument when said second binarization method is selected by enhancing edge pixels thereof, and converting the sharpened image of the entire negotiable instrument to binary image data.

12. (original) A computer-readable data storage medium containing a recorded program for executing the steps of the image processing method of claim 7 to electronically process a negotiable instrument.